

IN THE CLAIMS:

Please cancel claims 15 – 20, without prejudice.

- 1 1. (Currently Amended) A method of fabricating a membrane electrode assembly
2 for use in a fuel cell, including the steps of:
 - 3 (A) providing a mold that includes a first and second mold plate
4 adapted to impart a desired shape to induce compression;
 - 5 (B) providing a lead frame, including at least a first lead frame compo-
6 nent that is adapted to be received into said mold;
 - 7 (C) assembling a protonically conductive membrane with catalyst coat-
8 ings on each of its major surfaces onto said first lead frame com-
9 ponent;
 - 10 (D) placing said lead frame containing said membrane into the mold;
 - 11 (E) compressing said second mold plate onto said first mold plate;
 - 12 (F) introducing a moldable material in communication with said mold
13 plates;; and
 - 14 (G) allowing the moldable material to cure in said mold to solidify and
15 form a frame around said membrane to produce a membrane elec-
16 trode assembly for use in a fuel cell.
- 1 2. (Original) The method as defined in claim 1 including the further step of integrat-
2 ing a current collector into said first lead frame component onto which said mem-
3 brane is placed.
- 1 3. (Original) The method as defined in claim 2 including the further steps of:
 - 2 (A) providing a second lead frame component that includes a second current
3 collector; and

- 4 (B) sandwiching said catalyzed membrane between the first and second cur-
5 rent collectors;
- 6 (C) introducing the lead frame components into said mold;
- 7 (D) compressing the first and second mold plates together;
- 8 (E) introducing a moldable material into said mold;
- 9 (F) allowing the moldable material to cure to form the shape of the mold
10 plates thereby forming a sealed fuel cell.

1 4. (Original) The method as defined in claim 1 wherein the step of introducing the
2 moldable material includes injection molding a moldable material into said mold.

1 5. (Withdrawn) The method as defined in claim 1 wherein the step of introducing
2 the moldable material includes placing said moldable material onto said mold plates and
3 casting a frame around the membrane electrode assembly.

1 6. (Currently Amended) A method of fabricating a fuel cell array, including the
2 steps of:

- 3 (A) providing a mold that includes a first and second mold plate of a
4 desired shape that forms a cavity to induce compression;
- 5 (B) providing a sheet of protonically conductive membrane material
6 that has been coated on each of its major surfaces with a catalyst material to form
7 a sheet of catalyzed membrane;
- 8 (C) providing a lead frame structure that includes a plurality of indi-
9 vidual lead frame components that define separate fuel cells;
- 10 (D) assembling said sheet of catalyzed membrane into said lead frame
11 structure;
- 12 (E) placing said lead frame structure containing said membrane sheet
13 into the mold;
- 14 (F) compressing said second mold plate onto said first mold plate ;

- 15 (G) introducing a moldable material in communication with said mold
16 plates; and
17 (H) allowing the plastic to cure in said mold to solidify and form a
18 frame around said individual fuel cells to produce a fuel cell array.

- 1 7. (Original) A method of establishing a seal around a fuel cell, comprising the steps of:
2 (A) providing a lead frame assembly including:
3 (i) providing first and second current collectors adapted to serve as
4 lead frame components in an associated mold device;
5 (ii) assembling fuel cell components including:
6 (a) a catalyzed protonically conductive, electronically
7 non-conductive membrane; and
8 (b) first and second diffusion layers disposed on oppo-
9 site sides of said membrane;
10 (iii) arranging said fuel cell components between said first and
11 second current collectors;
12 (B) inserting the resulting lead frame assembly into a molding device;
13 (C) introducing a moldable material into said molding device; and
14 (D) allowing said moldable material to cure to seal the edges of the
15 lead frame assembly against leaks to thereby seal the fuel cell.

- 1 8. (Original) The method as defined in claim 7 comprising the further step of spot weld-
2 ing the first and second current collectors that serve as lead frame components together to
3 maintain the components in place.

- 1 9. (Original) The method as defined in claim 7 including the further step of trimming
2 excess lead frame component portions away from said fuel cell to result in a finished fuel
3 cell.

1 10. (Original) The method as defined in claim 7 including the further step of providing
2 said mold device with a mold cavity which, when said moldable material is introduced
3 into said mold cavity and cured, creates a frame around said fuel cell.

1 11. (Original) A method of establishing a sealed diffusion layer for use in a fuel cell in-
2 cluding the steps of:

3 (A) providing a first current collector integrated into a lead frame component;

4 (B) applying a diffusion layer material to said first current collector on said
5 lead frame component;

6 (C) providing a second current collector integrated into a lead frame compo-
7 nent;

8 (D) applying a second diffusion layer material to said second current collector
9 on said lead frame component;

10 (E) placing a catalyzed protonically conductive, electronically non-conductive
11 membrane between said first lead frame component and said second lead frame compo-
12 nent to form an assembly;

13 (F) placing said assembly into a molding device;

14 (G) closing mold plates associated with said molding device and hot pressing
15 the assembly for a predetermined time period;

16 (H) introducing a moldable material into said mold cavity of said mold device;
17 and

18 (I) allowing said moldable material to cure to seal said lead frame compo-
19 nents integrating said first and second current collectors together to form a fuel cell.

1 12. (Original) The method as defined in claim 11 wherein step (H) includes an insert
2 molding technique.

1 13. (Original) The method as defined in claim 11 including the further step of spot weld-
2 ing said first and second lead frame components together to maintain said components in
3 position prior to placing the assembly into the molding device.

1 14. (Currently Amended) A method of introducing compression into a fuel cell, com-
2 prising the steps of:

3 (A) providing a catalyst coated membrane;

4 (B) providing a first current collector integrated into a first lead frame compo-
5 nent suitable for being received into a molding device;

6 (C) providing a second current collector integrated into a second lead frame
7 component suitable for being received into a molding device;

8 (D) assembling said first and second current collectors on either side of said
9 membrane to result in an assembly;

10 (E) placing said assembly into said mold device that has been provided with
11 mold plates that form a cavity that induces compression;

12 (F) closing said mold plates and maintaining said mold plates in a closed posi-
13 tion to induce further compression; and

14 (G) introducing a moldable material into the resulting mold cavity thereby cre-
15 ating a frame around the fuel cell that maintains compression within said fuel cell without
16 the need for mechanical fasteners.

1 15. – 20. Cancelled